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Claims

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1. A child-restraint seat comprising
a seat shell including a bottom seat portion,
a child-restraint harness coupled to the seat shell, and
a harness-control panel formed to include a belt-receiving opening
receiving a shoulder belt portion of the child-restraint harness, the harness-control
panel being mounted on the seat shell for up and down movement relative to the seat
shell to raise and lower the shoulder belt portion of the child-restraint harness with
10 respect to the bottom seat portion to harness small-sized children and large-sized
children in a restrained position in the seat shell.
- 15 2. The child-restraint seat of claim 1, wherein the harness-control
plate includes a back plate formed to include first and second spaced-apart slots
defining the belt-receiving opening, the shoulder belt portion of the child-restraint
harness includes first and second shoulder belts, the seat shell further includes a back
support portion positioned to lie at an angle to the bottom seat portion and formed to
include first and second slanted channels aligned in spaced-apart diverging relation to
lie behind the back plate so that the first shoulder belt passes through the first slot and
first slanted channel and the second shoulder belt passes through the second slot and
20 second slanted channel during up and down movement of the harness-control panel
relative to the seat shell.
- 25 3. The child-restraint seat of claim 2, wherein the first slanted
channel has a nominal width and the first slot has a length that is greater than the
nominal width of the first slanted channel.
- 30 4. The child-restraint seat of claim 2, wherein the back support
portion is formed to include two guide slots arranged in spaced-apart relation to
position the first and second slanted channels therebetween, the harness-control panel
further includes two support arms coupled to the back plate, and each of the support
arms is arranged to extend through one of the guide slots.
- 65 The child-restraint seat of claim 4, further comprising means
coupled to the support arms and to the back support portion for moving the back plate
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and the first and second shoulder belts received in the first and second slots formed in the back plate up and down relative to the seat shell.

Sub 2 6. The child-restraint seat of claim 2, wherein the harness-control plate further includes a headrest provided in an upper portion of the back plate above the first and second spaced-apart slots and adapted to extend above an upper edge of the back support portion upon removal of the first and second shoulder belts from the first and second spaced-apart slots and the first and second slanted channels and movement of the harness-control panel to a highest position relative to the seat shell.

97 8. The child-restraint seat of claim 6, wherein the first and second spaced-apart slots are located in a position below the headrest to lie in spaced-apart relation to the first and second slanted channels upon movement of the harness-control panel to the highest position relative to the seat shell.

Sub a3 8. The child-restraint seat of claim 1, wherein the seat shell is formed to include a back support portion positioned to lie at an angle to the bottom seat portion and formed to include a guide slot and the harness-control panel includes a back plate (found to include) the belt-receiving opening and adapted to face toward a child seated in the seat shell and a support arm coupled to the back plate and arranged to extend through the guide slot and reciprocate up and down therein as the back plate moves up and down relative to the back support portion between a low position adapted to suit a small-sized child and a higher position adapted to suit a larger-sized child.

11-9 10. The child-restraint seat of claim 8, wherein the back support portion is also formed to include a slanted channel oriented to lie at an angle to the guide slot and arranged to receive the portion of the child-restraint harness therein and lie in communication with the belt-receiving opening formed in the back plate to enable movement of the portion of the child-restraint harness in the belt-receiving opening formed in the back plate and the slanted channel formed in the back support portion during up and down movement of the back plate relative to the seat shell.

12-10 11. The child-restraint seat of claim 9, wherein the slanted channel in the back support portion has a nominal width and the belt-receiving opening in the back plate is a slot having a length that is greater than the nominal width of the slotted channel.

Sub a4 11. The child-restraint seat of claim 8, wherein the back support portion is formed to include two spaced-apart guide slots and the harness-control panel includes two support arms coupled to the back plate and each support arm is arranged to extend through one of the guide slots.

5 *14 12* 12. The child-restraint seat of claim *8*¹⁰, wherein the harness-control panel includes first and second wing members coupled to opposite edges of the back plate and positioned to lie in spaced-apart relation to one another and the support arm is also coupled to one of the first and second wing members.

Sub a5 13. The child-restraint seat of claim 8, wherein the seat shell further includes a vertical back rib appended to the back support portion to position the back support portion between the harness-control panel and the vertical back rib and the vertical back rib is formed to include the guide slot.

15 14. The child-restraint apparatus of claim 1, wherein the seat shell further includes a back support portion positioned to lie at an angle to the bottom seat portion and further comprising means coupled to the back support portion for moving the harness-control panel up and down relative to the bottom seat portion.

17 15 15. The child-restraint apparatus of claim *14*¹⁶, wherein the moving means includes panel height locators coupled to the back support portion at different elevations above the bottom seat portion and means coupled to the harness-control panel for engaging a selected one of the panel height locators to establish a selected elevation of the harness-control panel and the shoulder belt portions of the child-restraint harness received in the belt-receiving opening formed in the harness-control panel above the bottom seat portion.

Sub a6 16. The child-restraint apparatus of claim 15, wherein the back support portion is formed to include an opening therein and the harness-control panel includes a back plate formed to include the belt-receiving opening and at least one support arm coupled to the back plate and to the engaging means and arranged to extend through the opening formed in the back support portion.

18 17 17. The child-restraint apparatus of claim *16*¹⁷, wherein the back support portion includes a front side facing toward a child seated in the seat shell and an opposite rear side, an anchor member is appended to the rear side and formed to include a plurality of vertically spaced-apart slots, and each slot defines one of the

panel height locators and is configured to receive a portion of the engaging means therein.

^{sub a7} 18. The child-restraint seat of claim 1, wherein the seat shell includes a back support portion positioned to lie at an angle to the bottom seat portion and formed to include at least two position locator slots and further comprising a belt support member engaging the child-restraint harness and a bar release member mounted for movement on the belt support member and formed to include a cam face arranged to act against the back support portion to disengage the belt support member from one of the at least two position locator slots in response to movement of the bar release member relative to the belt support member.

²¹ 19. The child-restraint seat of claim ²⁰18, wherein the bar release member includes first and second arms coupled to the belt support member and a grip handle interconnecting outer ends of the first and second arms.

²² 20. The child-restraint seat of claim ²¹19, wherein each of the first and second arms also includes an inner end positioned to lie adjacent to the back support portion and the cam face includes a cam surface formed on the inner end of each of the first and second arms.

²³ 21. The child-restraint seat of claim ²¹19, wherein the seat shell further includes a bar anchor member coupled to the back support portion and formed to include the position locator slots and the first and second arms are positioned to lie in spaced-apart relation to locate the bar anchor member therebetween.

²⁴ 22. The child-restraint apparatus of claim ²¹19, further comprising a spring urging the belt support member into one of the at least two position locator slots and compressing during movement of the bar release member on the belt support member to disengage the belt support member from one of the at least two position locator slots.

^{sub a8} 23. A child-restraint seat comprising
a seat back formed to include first and second slanted channels aligned in spaced-apart diverging relation,
a harness-control plate including a back plate formed to include a first slot communicating with the first slanted channel and a second slot communicating with the second slanted channel,

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a child-restraint harness including a first shoulder belt passing through the first slot and slanted channel and a second shoulder belt passing through the second slot and slanted channel, and

means for moving the harness-control plate up and down relative to the seat back to move the first and second shoulder belts passing through the first and second slots in the first and second slanted channels up and down relative to the seat back to accommodate small-sized and large-sized children.

~~27~~²⁴ The child-restraint seat of claim ~~25~~²⁶, wherein the moving means includes a belt support bar arranged to lie behind the seat back to position the seat back between the harness-control plate and the belt support bar and the first and second shoulder belts exit the first and second slanted channels to engage the belt support bar.

~~28~~²⁵ The child-restraint seat of claim ~~24~~²⁵, wherein the seat back is formed to include a guide slot, the harness-control panel further includes a support arm coupled to the back plate and to the belt support bar to move therewith and arranged to pass through the guide slot formed in the seat back.

26. The child-restraint seat of claim 25, wherein the seat back includes at least two position locator slots oriented to receive the belt support bar therein and the moving means includes at least one spring arranged to urge the belt support bar into one of the position locator slots upon movement of the belt support bar to lie in confronting relation therewith and bar release means for selectively moving the belt support bar against the at least one spring to disengage the one of the position locator slots to enable a user to move the belt support bar up and down relative to the seat back, thereby moving the harness-control panel and the first and second shoulder belts up and down relative to the seat back.

~~29~~²⁷ The child-restraint seat of claim ~~26~~²⁶, wherein the harness-control plate further includes a headrest provided in an upper portion of the back plate above the first and second spaced-apart slots and adapted to extend above an upper edge of the seat back upon removal of the first and second shoulder belts from the first and second spaced-apart slots and the first and second slanted channels and movement of the harness-control panel to a highest position relative to the seat shell.

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sub 210 28. The child-restraint seat of claim 27, wherein the first and second spaced-apart slots are located in a position below the headrest to lie in spaced-apart relation to the first and second slanted channels upon movement of the harness-control panel to the highest position relative to the seat shell.

5 *32* 29. A child-restraint seat comprising
a seat back formed to include first and second slanted channels aligned in spaced-apart diverging relation and formed to include a guide slot,

a harness-control plate including a back plate formed to include a first slot communicating with the first slanted channel and a second slot communicating
10 with the second slanted channel, the harness-control plate including a support arm appended to the back plate and extending therefrom through the guide slot,

a child-restraint harness including a first shoulder belt passing through the first slot and slanted channel and a second shoulder belt passing through the second slot and slanted channel,

15 an anchor member coupled to the seat back and formed to include at least two panel height locators, and

a panel-adjustment assembly coupled to the support arm and including a locking member that is movable relative to the support arm between a first position engaging one of the at least two panel height locators to prevent the harness-control
20 plate from moving relative to the seat back and a second position disengaged from the at least two panel height locators to allow the harness-control plate to move up and down relative to the seat back to move the first and second shoulder belts passing through the first and second slots and passing through the slanted channels up and down relative to the seat back to accommodate small-sized and large-sized children.

25 *33* 30. The child-restraint seat of claim *29* *32*, wherein the guide slot is a first guide slot, the seat back includes a second guide slot, and the first and second slanted channels are positioned to lie between the first and second guide slots.

34 31. The child-restraint seat of claim *30* *33*, wherein the anchor member is positioned to lie between the first and second slanted channels.

30 *35* 32. The child-restraint seat of claim *30* *33*, wherein the harness-control plate includes a second support arm appended to the back plate and extending

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therefrom through the second guide slot and the locking member extends between the first and second support arms.

~~36~~ ³⁵ 35. The child-restraint seat of claim ~~32~~ ³⁵, wherein the locking member is biased with respect to the first and second support arms toward the anchor member.

5 ~~37~~ ³⁵ 34. The child-restraint seat of claim ~~32~~ ³⁵, wherein the panel adjustment assembly includes a grip handle coupled to the locking member and movable to move the locking member between the first and second positions.

10 ~~38~~ ³² 35. The child-restraint seat of claim ~~29~~ ³², wherein the anchor member is a vertical rib, the locking member is a bar, and the vertical rib is formed to include a pair of bar-receiving slots that define the at least two panel height locators.

15 ~~39~~ ³⁸ 36. The child-restraint seat of claim ~~38~~ ³⁸, wherein the first and second shoulder belts each include respective portions that engage the bar.

20 ~~40~~ ³⁸ 37. The child-restraint seat of claim ~~35~~ ³⁸, wherein the bar is biased with respect to the support arm toward the vertical rib.

25 ~~41~~ ³⁸ 38. The child-restraint seat of claim ~~35~~ ³⁸, wherein the panel adjustment assembly includes a handle coupled to the bar for pivoting movement, the handle includes a cam face positioned in camming engagement with the seat back, and the cam face is shaped so that pivoting movement of the handle relative to the bar causes the bar to move between the first and second positions.

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